

thoughtful writer of the book before us; he no doubt would be among the first to admit that his "Principia" are for the most part rather of the nature of ripe reflections on medicine—well-balanced cogitations by a wise, experienced, and instructed physician, regarding his art, as it were, from a height. Such thoughts obtain their generality rather by selection and proportion than by the slow accumulations of "induction." For our own part, we should have been disposed to prefer for this book some such a title as "Contemplations on Medicine."

Yet if we are indisposed to accept Dr. Sainsbury's mature reflections as "principia" in the sense of scientific theory, we are far from saying that it is useless to step thus backwards, or upwards, occasionally, so as to take more comprehensive glances of our science and art, and to delineate its larger features, so far as a slight sketch may go. By standing clear for a moment of the multiplicity of detail we gain a better sense of the proportions of the parts. The danger of this method is, of course, lest we mistake mere generalities for laws, dialectic for analysis of origins, and axioms of provisional service for verified and permanent conceptions. And it would be too much to say that Dr. Sainsbury has wholly escaped this danger; in some chapters his broad and detached way of looking at things is significant and illuminating, in others the attenuation of detail tends to vapidness, and thought is diluted until it becomes somewhat artificial and prosy. On the other hand, it may be just to say that no one could perhaps have penetrated farther in his way than Dr. Sainsbury does, and we have admitted that the change of attitude is needed occasionally to guide us and to give us wider bearings.

It would not be appropriate, then, to enter upon controversies with the author on matters of detail. It would not be difficult or unjust to do so, in many details, if the point of view were in itself more particular; but the author would be justified in answering that his reflections must be judged, not by items, but by the truth of the general point of view, and his answer would have weight. We forbear, then, from picking out from the joints of his edifice mortar which in not a few places seems to us to be unsound. Many a queried paragraph we may pass over in silence, as we must refrain from quoting many a happy one.

To turn to the larger aspects of the subjects, those general thoughts which the author had in view are often very well put; such as his conception of "compensation" as but part of the adaptation of stable moving equilibria to their environments, so that cardiac "compensation," for instance, too often conceived with more than a spice of teleology, is a re-adaptation of the same general kind as immunity to bacterial and other poisons, and so forth. The whole of chapter vi. is interesting, perhaps the best in the book; the relative incidence of remedies in time is dwelt upon, and the potentialities of combinations of drugs—a practice in recent years much neglected—are fully discussed, their mutual enhancements or cross-purposes considered, and an explanation given of the

chemical room left in the body for additional drugs as these may be in a solution saturated by one or more previously dissolved. Pp. 126-9, which deal with this part of the subject, are felicitous, and also the few pages following. Many sentences, too, are happily put, as, for instance, on p. 40:—"It may here be noted how it is that the organism as a whole secures its excretory stability, namely, by not carrying to the extreme the process of differentiation through which the higher types of tissue have arisen," &c. In another paragraph Dr. Sainsbury estimates in general terms the relative vigour of the communal and individual life of several parts. The chapter on diet, again, is good, especially the discussion on alcohol.

We must be forgiven if, in conclusion, we express the opinion that, in one respect at any rate, the author has not been watchful, namely, to counteract that tendency to flatness or dilution of thought which we have said is almost inseparable from speculative contemplations, and to endeavour to prevent prosiness and vagueness, by apt and penetrating phrases and instances. The quotations, which are made with some profusion, many of them bits of Latin, should have been fresh and "inevitable," but Dr. Sainsbury has not gone out of his way to seek for telling quotations. Almost all of them are well-worn "tags"; some are stale indeed. A common sentiment gains nothing by reiteration in Latin; *modus operandi* is no better than "mode of operation," and *non pane solo vivit homo* sounds to us better in our mother tongue. These points may receive attention in the new edition which the book deserves. The volume is well printed, and light in the hand.

T. C. A.

OPTICAL INSTRUMENTS.

Leitfaden der praktischen Optik. By Dr. Alexander Gleichen. Pp. viii+221. (Leipzig: S. Hirzel, 1906.) Price 5.60 marks.

OF the making of German optical text-books there is no end, and there are perhaps few which do not constitute valuable additions to optical literature. The present volume, however, does not pretend to furnish new material, and it is improbable that it will be found of any special interest to opticians in this country. It is, indeed, not easy to gather for what class of reader the work has been designed. The preface suggests that the mathematical knowledge assumed in the ordinary treatises on optical instruments is usually lacking to the practical optician, and that it seemed a not altogether useless task to explain the principles of the theory of optical instruments, their construction and design, on the basis of an acquaintance with mathematics not extending beyond the first elements of algebra. Thus should the practical optician be provided with matter he could digest and the student with a stepping-stone to the treatises aforesaid, not the least useful among which are the author's own "*Lehrbuch der geometrischen Optik*" and his text-books on special departments of optics.

It would seem to us, accepting the writer's own account of his intention, that the requirements neither of the student nor of the practical optician have been kept sufficiently clearly in view. It is probably rather to the amateur who wishes to acquire an intelligent appreciation of the main principles of construction of the more important optical instruments that the book will appeal. The practical optician is daily confronted with problems towards the solution of which he will here find little help, while the student who looks for an introduction to the subject will scarcely do well to acquire the elements of optics from a work in which the necessary mathematics are so entirely kept out of sight. For the general reader the volume presents many excellent features, yet even to him we would prefer to recommend Moritz von Rohr's admirable little book, "*Die optischen Instrumente*," which provides for the non-mathematician a very considerable amount of information in the smallest compass.

For the rest, the matter is carefully arranged and the explanations of technical points clearly and simply given. The usual portions of the subject are included—the elementary theory of mirrors, prisms and lenses, the optics of the eye, the microscope, telescope, and the photographic lens. There is a chapter also on stereoscopy, in which some of the modern developments are shortly treated. The variable power telescope receives rather more attention than is usual. Tables are given for the calculation of achromatic lenses and of prism combinations, and throughout the book attention has been paid to the furnishing of numerical data. These, however, might easily be rendered more complete—e.g. particulars as to the field of view obtainable at various powers in telescopes of different pattern would be of value. Complete data are provided for the construction of certain well-known combinations, direct-vision prisms, eyepieces, microscope objectives, photographic lenses, &c. The provision of numerical information is, indeed, the most characteristic feature of the book, and will render it of value for occasional reference to some who are already familiar with the author's presentment of the optical theory.

OUR BOOK SHELF.

Die Eisenindustrie. By Oskar Simmersbach. Pp. x+322. (Leipzig and Berlin: B. G. Teubner, 1906.) Price 7.20 marks.

In German technical literature there are excellent exhaustive treatises on the metallurgy of iron, and students' manuals, *at least* in abundance, but Mr. Simmersbach's work on the economics of the iron trade opens up an entirely new field. The leading principles and practices of the German iron trade are made clear, and a careful study of the information set forth cannot fail to prevent much waste of time and misapplication of energy in the conduct of business. The various chapters are well worthy of attentive study, and the book should find a place in the library of all who have any connection with the iron industry.

The first eight chapters give a concise introduction to the technology of iron and steel. They deal respectively with iron and its alloys, raw materials,

blast-furnace practice, steelworks practice, rolling mills, testing of iron and steel, foundry practice, and the testing of cast iron and cast steel. The remaining seven chapters, dealing with the economics of iron and steel, are of greater interest. A general sketch of the importance of the world's iron trade is followed by chapters on the world's ore trade, the world's coal and coke trade, the world's pig-iron trade, the world's trade in castings, and the world's trade in malleable iron and steel. The final chapter deals with labour conditions and customs tariffs. The author takes an exceedingly optimistic view of the German coal and iron-ore resources. Germany is, he thinks, richer in iron ores than the rest of the Continental countries put together, and he explains the annual importation of more than six million tons of foreign ores as being the outcome of high railway charges. At the present rate of coal consumption there is, he believes, enough coal in Germany still unworked to last for 3520 years. These figures contrast strongly with his pessimistic views of the available resources of other countries. Prophecies as to the future of the world's iron trade are, however, of little moment.

The chief value of the author's work is in the abundance of admirably arranged statistical material regarding the present condition of the iron and steel industries, and in the evidence amply afforded of the manner in which science has superseded the old rule-of-thumb methods of carrying on operations at iron and steel works. A chapter on trusts, cartels, and syndicates would have been a useful addition to the work, and the absence of an index is to be deplored.

A Text-book of Fungi. By G. Massee. Pp. xi+427. (London: Duckworth and Co., 1906.) Price 6s. net.

The fungi constitute numerically the most extensive group of plants, and at the same time they present the largest number of unsolved problems; this, too, despite the fact that, as the author says, our knowledge has increased by leaps and bounds.

Mr. Massee plunges at once *in medias res*, and proceeds to describe modern cytological developments, their legitimate and strained applications, and certain lines of inquiry pursued by Marshall Ward. Recent work has widened our knowledge of conidia, spores of various kinds, and other methods of reproduction. The author has introduced the salient facts both of sexual and asexual reproduction, but fails to offer a logical definition or a practical limitation of the terms spore, sporophore, &c. The chapter on sexual reproduction contains useful summaries of Blakeslee's account of the Mucorineæ, Thaxter's investigations of the Laboulbeniaceæ, as well as Dangeard's and Blackman's researches. The author's views on parasitism in fungi are set forth, and reference is made to experiments on similar lines by Miss Gibson and Mr. E. S. Salmon, the latter of whom has contributed the chapter on "biologic forms." Closely allied with the spread of disease, which provides the opportunity for noting the insidious danger of hibernating mycelium, is the subject of legislation. Mr. Massee enunciates his arguments, which are mainly to show that, unless it is exceedingly drastic, legislation to prevent the introduction of plant diseases through imported plants and seeds would be useless.

On the subject of classification, the opinion of the author as an acknowledged exponent is especially valuable, and the reader will find clear, and we think convincing, reasoning in favour of the acceptance of Brefeld's main groupings. The personal views on phylogeny appearing earlier in the book should be